Supplementary Data 1. Definitions

Definitions:

The systematic review included only population-based studies to obtain representative samples of the wider target populations, avoid selection bias inherent in the hospital-based studies and provide a greater generalisation of results. A population-based study was defined as a study that included the entire adult populations with clinically verified RA by physical examination by a doctor or meeting one of the RA classification criteria sets (1, 2) and resident in a defined country or geographic setting. We grouped the population-based studies based on population sampling methodology to (a) sampling population studies and (b) population database studies. Sampling population studies draw a representative sample from the target population to estimate the prevalence of RA, while population database studies used clinical and/or non-clinical health databases that cover a large proportion of extant populations for estimating the RA prevalence for the target population. Two different approaches were applied in this study to estimate RA point- and period-prevalence. RA was categorised across six criteria sets depending on the time of the study and included the ARA criteria 1956 (3), Rome criteria 1961 (4), revised ARA criteria 1987 (5), modified ARA criteria 1987 for population studies (6), and the American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) criteria 2010 (2), and verified RA clinical diagnosis by a doctor. We grouped data sources into four categories: linked health data, administrative databases, register data, and population-based surveys (P.B.SU). Linked data were defined as the combining of one or more different data sources to capture complete ascertainment of RA diagnosis than in the stand-alone data sets such as administrative data or registry data. Administrative data defined as a resource utilisation data that designed to capture RA cases and provide billing information for insurers, while register data is defined as clinical uniform data that designed to evaluate RA prevalence for quality improvement or research (7, 8). P.B.SU data defined as a survey data that designed to temporary measure the RA prevalence in an appropriate representation of target populations based on our inclusion criteria, in order to inform the policymakers to determine the nature of the services required for the disease. We defined the geographic population settings as an urban, rural and mixed zone based on the geographic description reported in the studies. To compare RA prevalence across populations with different socioeconomic status, we also grouped studies based on Worlds Bank's income classification levels (9).

References:

1. MacGregor AJ. Classification criteria for rheumatoid arthritis. Baillieres Clin Rheumatol 1995;9:287-304.
2. Aletaha D, Neogi T, Silman AJ, Funovits J, Felson DT, Bingham CO, 3rd, et al. 2010 rheumatoid arthritis classification criteria: An american college of rheumatology/european league against rheumatism collaborative initiative. Arthritis Rheum 2010;62:2569-81.
3. Ropes MW, Bennett GA, Cobb S, Jacox R, Jessar RA. Proposed diagnostic criteria for rheumatoid arthritis: Report of a study conducted by a committee of the american rheumatism association. Ann Rheum Dis 1957;16:118.
4. Kellgren JH. Diagnostic criteria for population studies. Bull Rheum Dis 1962;13:291.
5. Arnett FC, Edworthy SM, Bloch DA, McShane DJ, Fries JF, Cooper NS, et al. The american rheumatism association 1987 revised criteria for the classification of rheumatoid arthritis. Arthritis Rheum 1988;31:315-24.
6. MacGregor A, Bamber S, Silman A. A comparison of the performance of different methods of disease classification for rheumatoid arthritis. Results of an analysis from a nationwide twin study. The Journal of rheumatology 1994;21:1420-6.
7. Dokholyan RS, Muhlbaier LH, Falletta JM, Jacobs JP, Shahian D, Haan CK, et al. Regulatory and ethical considerations for linking clinical and administrative databases. Am Heart J 2009;157:971-82.
8. Dreyer NA, Garner S. Registries for robust evidence. JAMA 2009;302:790-1.
9. World Bank. New country classifications income level: 2019-2020. [Internet. Accessed April 04, 2020.] Available from: https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2019-2020

Supplementary Table 1. PRISMA 2009 checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	-
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4 & S2
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Table S2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	S3, Table S3
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5 and S1
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4, S3, Table S3
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	4

Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	5

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	S3, Table S3
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	-
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	6
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	6
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	S7
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	6–8, S3, Table S3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	8–10
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Table S5
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	-
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	10-14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	14
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	14
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097.

Supplementary Data 2. Search strategy and sample search terms

Search strategy

A literature search was conducted by the first author according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 recommendations to locate studies in relevant databases, including ProQuest, MEDLINE (Ovid), Web of Science, and EMBASE (Ovid). The results of each search were loaded into EndNote Volume X.8 (Clarivate Analytics, PA, USA). Medical Subject Headings and the keywords were used in the search machines were peer-reviewed between first author, senior supervising author (CI) and senior librarian (SB). Different keywords were chosen, and the search was conducted using 'AND' and 'OR' in the search section of the databases (Supplemental Table 2). Reference lists from retrieved studies were used to identify more studies and were selected based on the systematic review inclusion criteria.

The search results were yielded 67 population-based studies which more and best composition than previous published systematic reviews. Selection of studies was based on our stringent eligibility criteria, and it was verified by the senior supervising author (CI). The evidence of robust search and studies selection was seen in a higher number of relevant studies, and no high-risk bias studies were included in our data.

All authors were involved in the development of the search strategy, the eligibility criteria, and data extraction sheet—the first author who run the search in multiple databases. The search strategy was tested and reiterated several times for search completeness with support of senior supervising author (CI) and senior librarian (SB) to identify extra possible search items and synonyms that can be found in relevant studies based on PRISMA 2009 recommendations.

Supplementary Table 2. Medline search strategy.

1	Prevalence/
2	Trends.mp.
3	Rate.mp.
4	Epidemiology/
5	Arthritis, Rheumatoid/
6	Linked data.mp.
7	Survey.mp.
8	Administrative data.mp.
9	Clinical diagnosis.mp.
10	Registry.mp.
11	Population based study.mp.
12	1 or 2 or 3 or 4 or 11
13	6 or 7 or 8 or 9 or 10 or 11
14	5 and 12 and 13
15	limit 14 to (English language and Full Text and humans and yr="1980 - 2019" and "all adult ")

Supplementary Data 3. Risk of bias assessment method and data extraction

Risk of bias assessment:

The research articles selected for this review were evaluated by one independent reviewer (KM) and verified by the senior supervising author (CI) for methodological validity before inclusion in the review using the Hoy et al. tool for risk of bias of prevalence studies (1) (Supplemental Table 3). The advantage of this tool it makes a distinction between assessing whether the research was conducted to the highest possible standards for methodological quality and to which extent the results have risk bais. The Hoy et al. risk bias tool consists of ten questions where "Yes" answer implications a low risk of bias and "No" answer a high risk of bias. These ten questions include:

External validity:

1. Was the target population a close representation of the general population?
2. Was the sampling frame a close representation of the target population?
3. Was some form of random selection used to select the sample?
4. Was the likelihood of non-response bias minimal?

Internal validity:

5. Was data collected directly from the subjects?
6. Was an acceptable case definition used?
7. Was the study instrument that measured the parameter of interest shown to have reliability and validity?
8. Was the same mode of data collection used all subjects?
9. Were the numerator and denominator for the parameter of interest appropriate?
10. Was the length of the shortest prevalence period for the parameter of interest appropriate?

When interpreting studies on the prevalence of RA, these important questions were considered in the present review. The published studies were reviewed and evaluated, and studies that met inclusion criteria were incorporated in the systematic review.

Data extraction

The study information (such as authors, year, country where the study was conducted) was initially recorded. All the information related to participants, such as the source population size and sample size who participated in the study, was extracted. The methodology section, the method used to measure RA prevalence, such as point- or period-prevalence, was outlined. The data sources such as administrative databases, linked data, medical records, register data and P.B.SU were also extracted.

Supplementary Table 3. Risk bias assessment checklist for Prevalence studies (1).

Name of author(s):
Publication title:
Year of publication:

Risk of bias items	Risk of bias levels	Points scored
1. Was the study's target population a close representation of the national population in relation to relevant variables, e.g. age, sex, occupation?	Yes (LOW RISK): The study's target population was a close representation of the national population.	0
	No (HIGH RISK): The study's target population was clearly NO representative of the national population.	1
2. Was the sampling frame a true or close representation of the target population?	Yes (LOW RISK): The study's target population was a close representation of the national population.	0
	No (HIGH RISK): The study's target population was clearly NOT representative of the national population.	1
3. Was some form of random selection used to select the sample. OR, was a census undertaken?	Yes (LOW RISK): A census was undertaken, OR. some form of random selection was used to select the sample (e.g. simple random sampling, stratified random sampling, cluster sampling, systematic sampling).	0
	No (HIGH RISK): The study's target population was clearly NOT representative of the national population.	1
4. Was the likelihood of non-response bias minimal?	Yes (LOW RISK): The response rate for the study was >75%, OR. An analysis was performed that showed no significant difference in relevant demographic characteristics between responders and non- responders	0
	No (HIGH RISK): The response rate was <75%, and if any analysis comparing responders and non-responders was done, it showed a significant difference in relevant demographic characteristics between responders and non-responders	1
5. Were data collected directly from the subjects (as opposed to a proxy)?	Yes (LOW RISK): All data were collected directly from the subjects.	0
	No (HIGH RISK): In some instances, data were collected from a proxy.	1
6. Was an acceptable case definition used in the study?	Yes (LOW RISK): An acceptable case definition was used.	0
	No (HIGH RISK): An acceptable case definition was NOT used.	1
7. Was the study instrument that measured the parameter of interest (e.g. prevalence of low back pain) shown to have reliability and validity (if necessary)?	Yes (LOW RISK): The study instrument had been shown to have reliability and validity (if this was necessary), e.g. test-re- test, piloting. validation in a previous study, etc.	0
	No (HIGH RISK): The study instrument had NOT been shown to have reliability or validity (if this was necessary).	1
8. Was the same mode of data collection used for all subjects?	Yes (LOW RISK): The same mode of data collection was used for all subjects.	0
	No (HIGH RISK): The same mode of data collection was NOT used for all subjects.	1
9. Were the numerators) and denominator r(s) for the parameter of interest appropriate	Yes (LOW RISK): The paper presented appropriate numerator(s) AND denominator(s) for the parameter of interest (e.g. the prevalence of low back pain).	0
	No (HIGH RISK): The paper did present numerators) AND denominator(s) for the parameter of interest but one or more of these were inappropriate.	1
10. Was the length of the shortest prevalence period for the parameter of interest appropriate?	Yes (LOW RISK): The length of the shortest prevalence period for the parameter of interest was appropriate (e.g. point prevalence).	0
	No (HIGH RISK): The length of the shortest prevalence period for the parameter of interest was not appropriate (e.g. life-time prevalence).	1
Summary on the overall risk of study bias point score: LOW RISK 0-3 MODERATE RISK 4-6 HIGH RISK 7-10		

Reference:

1. Hoy D, Brooks P, Woolf A, Blyth F, March L, Bain C, et al. Assessing risk of bias in prevalence studies: Modification of an existing tool and evidence of interrater agreement. J Clin Epidemiol 2012;65:934-9.

Supplementary Data 4. Excluded studies and reasons for exclusion

Excluded studies:

Studies were excluded primarily from the review for the following reasons: (a) out the scope of the prevalence of RA (n=38); (b) not a representative sample of the general population (n=28); (c) narrative review (n=12).

Excluded studies and reasons for exclusion.

Aho K, Kaipiainen-Seppanen O, Heliovaara M, Klaukka T. Epidemiology of rheumatoid arthritis in Finland. Seminars in arthritis and rheumatism. 1998;27(5):325–34.

Reason for exclusion: review

Akhter E, Bilal S, Kiani A, Haque U. Prevalence of arthritis in India and Pakistan: a review. Rheumatol Int. 2011;31(7):849–55.

Reason for exclusion: review

Al-Herz A, Al-Awadhi A, Saleh K, Al-Kandari W, Hasan E, Ghanem A, et al. Low Prevalence of Nodules in Rheumatoid Arthritis Patients in Kuwait: A Description and a Comparison of Patients from the Kuwait Registry for Rheumatic Diseases. Med Princ Pract. 2017;26(2):152–6.

Reason for exclusion: out of scope

Alamanos Y, Drosos AA. Epidemiology of adult rheumatoid arthritis. Autoimmunity reviews. 2005;4(3):130–6.

Reason for exclusion: review

Alamanos Y, Voulgari PV, Drosos AA. Incidence and prevalence of rheumatoid arthritis, based on the 1987 American College of Rheumatology criteria: a systematic review. Seminars in arthritis and rheumatism. 2006;36(3):182–8.

Reason for exclusion: systematic review

Albrecht K, Luque Ramos A, Hoffmann F, Redeker I, Zink A. High prevalence of diabetes in patients with rheumatoid arthritis: results from a questionnaire survey linked to claims data. Rheumatology (Oxford). 2018;57(2):329–36.

Reason for exclusion: out of scope

Anaya JM, Correa PA, Mantilla RD, Jimenez F, Kuffner T, McNicholl JM. Rheumatoid arthritis in African Colombians from Quibdo. Seminars in arthritis and rheumatism. 2001;31(3):191–8.

Reason for exclusion: sub-population

Barrera P, Radstake TR, Albers JM, van Riel PL, van de Putte LB. Familial aggregation of rheumatoid arthritis in The Netherlands: a cross-sectional hospital-based survey. European Consortium on Rheumatoid Arthritis families (ECRAF). Rheumatology (Oxford). 1999;38(5):415–22.

Reason for exclusion: sub-population

Bellamy N, Duffy D, Martin N, Mathews J. Rheumatoid arthritis in twins: a study of aetiopathogenesis based on the Australian Twin Registry. Ann Rheum Dis. 1992;51(5):588–93.

Reason for exclusion: sub-population

Bongartz T, Nannini C, Medina-Velasquez YF, Achenbach SJ, Crowson CS, Ryu JH, et al. Incidence and

mortality of interstitial lung disease in rheumatoid arthritis: a population-based study. Arthritis and rheumatism. 2010;62(6):1583–91.

Reason for exclusion: out of scope

Boyer GS, Benevolenskaya LI, Templin DW, Erdesz S, Bowler A, Alexeeva LI, et al. Prevalence of rheumatoid arthritis in circumpolar native populations. The Journal of rheumatology. 1998;25(1):23–9.

Reason for exclusion: sub-population

Brunier L, Bleterry M, Merle S, Derancourt C, Polomat K, Dehlinger V, et al. Prevalence of rheumatoid arthritis in the French West Indies: Results of the EPPPRA study in Martinique. Joint Bone Spine. 2017;84(4):455–61.

Reason for exclusion: sub-population

Buchbinder R, March L, Lassere M, Briggs AM, Portek I, Reid C, et al. Effect of treatment with biological agents for arthritis in Australia: the Australian Rheumatology Association Database. Internal medicine journal. 2007;37(9):591–600.

Reason for exclusion: out of scope

Carmona L, Ballina J, Gabriel R, Laffon A, Episer Study Group. The burden of musculoskeletal diseases in the general population of Spain: results from a national survey. Ann Rheum Dis. 2001;60(11):1040–5.

Reason for exclusion: Duplicate

Chauhan K, Ackerman MJ, Crowson CS, Matteson EL, Gabriel SE. Population-based study of QT interval prolongation in patients with rheumatoid arthritis. Clinical and experimental rheumatology. 2015;33(1):84–9.

Reason for exclusion: out of scope

Chen HH, Huang N, Chen YM, Chen TJ, Chou P, Lee YL, et al. Association between a history of periodontitis and the risk of rheumatoid arthritis: a nationwide, population-based, case-control study. Ann Rheum Dis. 2013;72(7):1206–11.

Reason for exclusion: out of scope

Cobo-Ibanez T, Descalzo MA, Loza-Santamaria E, Carmona L, Munoz-Fernandez S. Serious infections in patients with rheumatoid arthritis and other immune-mediated connective tissue diseases exposed to anti-TNF or rituximab: data from the Spanish registry BIOBADASER 2.0. Rheumatol Int. 2014;34(7):953–61.

Reason for exclusion: out of scope

Covic T, Cumming SR, Pallant JF, Manolios N, Emery P, Conaghan PG, et al. Depression and anxiety in patients with rheumatoid arthritis: prevalence rates based on a comparison of the Depression, Anxiety and Stress Scale (DASS) and the hospital, Anxiety and Depression Scale (HADS). BMC Psychiatry. 2012;12:6.

Reason for exclusion: out of scope

Del Puente A, Knowler WC, Pettitt DJ, Bennett PH. High incidence and prevalence of rheumatoid arthritis in Pima Indians. Am J Epidemiol. 1989;129(6):1170–8.

Reason for exclusion: sub-population

Doran MF, Crowson CS, O'Fallon WM, Gabriel SE. The effect of oral contraceptives and estrogen replacement therapy on the risk of rheumatoid arthritis: a population based study. The Journal of rheumatology. 2004;31(2):207–13.

Reason for exclusion: sub-population

Erdes S, Alekseeva LI, Krylov Mi, Kariakin AN, Benevolenskaia LI. [The prevalence of rheumatoid arthritis and the rheumatoid factor in the native inhabitants of northeastern Siberia]. Ter Arkh. 1999;71(5):9–12.

Reason for exclusion: Article in Russian

Feldman DE, Bernatsky S, Haggerty J, Leffondre K, Tousignant P, Roy Y, et al. Delay in consultation with specialists for persons with suspected new-onset rheumatoid arthritis: a population-based study. Arthritis and rheumatism. 2007;57(8):1419–25.

Reason for exclusion: out of scope

Finckh A, Simard JF, Duryea J, Liang MH, Huang J, Daneel S, et al. The effectiveness of anti-tumor necrosis factor therapy in preventing progressive radiographic joint damage in rheumatoid arthritis: a population-based study. Arthritis and rheumatism. 2006;54(1):54–9.

Reason for exclusion: out of scope

Firth J, Hale C, Helliwell P, Hill J, Nelson EA. The prevalence of foot ulceration in patients with rheumatoid arthritis. Arthritis and rheumatism. 2008;59(2):200–5.

Reason for exclusion: out of scope

Galushko EA, Erdes Sh F, Bazorkina DI, Bol'shakova Ti, Vinogradova IB, Lesniak OM, et al. [Prevalence of rheumatoid arthritis in Russia (according to epidemiological findings)]. Ter Arkh. 2010;82(5):9–14.

Reason for exclusion: Article in Russian

Gist AC, Guymer EK, Eades LE, Leech M, Littlejohn GO. Fibromyalgia remains a significant burden in rheumatoid arthritis patients in Australia. Int J Rheum Dis. 2018;21(3):639–46.

Reason for exclusion: out of scope

Hagen KB, Kvien TK, Bjorndal A. Musculoskeletal pain and quality of life in patients with noninflammatory joint pain compared to rheumatoid arthritis: a population survey. The Journal of rheumatology. 1997;24(9):1703–9.

Reason for exclusion: out of scope

Hah JH, An SY, Sim S, Kim SY, Oh DJ, Park B, et al. A population-based study on the association between rheumatoid arthritis and voice problems. Clinical rheumatology. 2016;35(7):1873–8.

Reason for exclusion: Sub population

Hameed K, Gibson T. A comparison of the prevalence of rheumatoid arthritis and other rheumatic diseases amongst Pakistanis living in England and Pakistan. Br J Rheumatol. 1997;36(7):781–5.

Reason for exclusion: sub-population

Helmick CG, Felson DT, Lawrence RC, Gabriel S, Hirsch R, Kwoh CK, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part I. Arthritis and rheumatism. 2008;58(1):15–25.

Reason for exclusion: review

Hochberg MC, Johnston SS, John AK. The incidence and prevalence of extra-articular and systemic manifestations in a cohort of newly-diagnosed patients with rheumatoid arthritis between 1999 and 2006. Current Medical Research and Opinion. 2008;24(2):469–80.

Reason for exclusion: out of scope

Hooyman JR, Melton LJ, Nelson AM, O'Fallon WM, Riggs BL. Fractures after rheumatoid arthritis. A population-based study. Arthritis and rheumatism. 1984;27(12):1353–61.

Reason for exclusion: Using secondary data

Hoy D, Brooks P, Woolf A, Blyth F, March L, Bain C, et al. Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. J Clin Epidemiol. 2012;65(9):934–9.

Reason for exclusion: out of scope

Hsu CC, Chen SC, Liu CJ, Lu T, Shen CC, Hu YW, et al. Rheumatoid arthritis and the risk of bipolar disorder: a nationwide population-based study. Public Library of Science one. 2014;9(9):e107512.

Reason for exclusion: out of scope

Hsu FC, Starkebaum G, Boyko EJ, Dominitz JA. Prevalence of rheumatoid arthritis and hepatitis C in those age 60 and elderlyer in a US population based study. Journal of Rheumatology. 2003;30(3):455–8.

Reason for exclusion: sub-population

Huang MC, Pai FT, Lin CC, Chang CM, Chang HH, Lee YC, et al. Characteristics of traditional Chinese medicine use in patients with rheumatoid arthritis in Taiwan: A nationwide population-based study. J Ethnopharmacol. 2015;176:9–16.

Reason for exclusion: out of scope

Hur N-W, Choi C-B, Uhm W-S, Bae S-C. The prevalence and trend of arthritis in Korea: results from Korea National Health and Nutrition Examination Surveys. The journal of the Korean rheumatism association. 2008;15(1):11–26.

Reason for exclusion: Article in Korean

Jacobsson L, Lindgärde F, Manthorpe R. The Commonest Rheumatic Complaints of Over Six Weeks' Duration in a Twelve-month Period in a Defined Swedish Population Prevalences and Relationships. Scandinavian journal of rheumatology. 1989;18(6):353–60.

Reason for exclusion: out of scope

Jacobsson LT, Knowler WC, Pillemer S, Hanson RL, Pettitt DJ, Nelson RG, et al. Rheumatoid arthritis and mortality. A longitudinal study in Pima Indians. Arthritis and rheumatism. 1993;36(8):1045–53.

Reason for exclusion: sub-population

Jeong H, Baek SY, Kim SW, Eun YH, Kim IY, Kim H, et al. Comorbidities of rheumatoid arthritis: Results from the Korean National Health and Nutrition Examination Survey. Public Library of Science one. 2017;12(4):e0176260.

Reason for exclusion: out of scope

Jeong HS, Hong SJ, Choi SJ, Kim JH, Song GG, Jung JH. Effects of oral contraceptives on rheumatoid arthritis in Korean menopausal women: A nationwide cross-sectional study. Maturitas. 2018;112:24–8.

Reason for exclusion: Sub population

Jin S, Li M, Fang Y, Li Q, Liu J, Duan X, et al. Chinese Registry of rheumatoid arthritis (CREDIT): II. prevalence and risk factors of major comorbidities in Chinese patients with rheumatoid arthritis. Arthritis research & therapy. 2017;19(1):251.

Reason for exclusion: out of scope

Karsh J, Chen Y, Lin M, Dales R. The association between allergy and rheumatoid arthritis in the Canadian population. Eur J Epidemiol. 2005;20(9):783–7.

Reason for exclusion: Using secondary data

Kato E, Sawada T, Tahara K, Hayashi H, Tago M, Mori H, et al. The age at onset of rheumatoid arthritis is increasing in Japan: a nationwide database study. Int J Rheum Dis. 2017;20(7):839–45.

Reason for exclusion: out of scope

Kauppi M, Hartikainen S, Kautiainen H, Laiho K, Sulkava R. Capability for daily activities in old people with rheumatoid arthritis: a population based study. Ann Rheum Dis. 2005;64(1):56–8.

Reason for exclusion: sub-population

Kaushik P, Solomon DH, Greenberg JD, Anderson JT, Reed G, Pala O, et al. Subcutaneous nodules are associated with cardiovascular events in patients with rheumatoid arthritis: results from a large US registry. Clinical rheumatology. 2015;34(10):1697–704.

Reason for exclusion: out of scope

Kvien TK, Uhlig T. The population based studies in rheumatoid arthritis. A method of longterm followup studies. J Rheumatol Suppl. 2004;69:35–40.

Reason for exclusion: review

Lacaille D, Guh DP, Abrahamowicz M, Anis AH, Esdaile JM. Use of nonbiologic disease-modifying antirheumatic drugs and risk of infection in patients with rheumatoid arthritis. Arthritis and rheumatism. 2008;59(8):1074–81.

Reason for exclusion: Using secondary data

Laiho K, Tuomilehto J, Tilvis R. Prevalence of rheumatoid arthritis and musculoskeletal diseases in the elderly population. Rheumatol Int. 2001;20(3):85–7.

Reason for exclusion: sub-population (elderly patients)

Lau E, Symmons D, Bankhead C, MacGregor A, Donnan S, Silman A. Low prevalence of rheumatoid arthritis in the urbanized Chinese of Hong Kong. The Journal of rheumatology. 1993;20(7):1133–7.

Reason for exclusion: Abstract

Lawrence RC, Helmick CG, Arnett FC, Deyo RA, Felson DT, Giannini EH, et al. Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. Arthritis & Rheumatism: Official Journal of the American College of Rheumatology. 1998;41(5):778–99.

Reason for exclusion: review

Liao CY, Chan HT, Chao E, Yang CM, Lu TC. Comparison of total hip and knee joint replacement in patients with rheumatoid arthritis and osteoarthritis: a nationwide, population-based study. Singapore Med J. 2015;56(1):58–64.

Reason for exclusion: out of scope

Lin HC, Chen SF, Lin HC, Chen YH. Increased risk of adverse pregnancy outcomes in women with rheumatoid arthritis: a nationwide population-based study. Ann Rheum Dis. 2010;69(4):715–7.

Reason for exclusion: out of scope

Linos A, Worthington JW, O'Fallon WM, Kurland LT. The epidemiology of rheumatoid arthritis in Rochester, Minnesota: a study of incidence, prevalence, and mortality. Am J Epidemiol. 1980;111(1):87–98.

Reason for exclusion: Duplicate

MacGregor AJ, Riste LK, Hazes JM, Silman AJ. Low prevalence of rheumatoid arthritis in black-Caribbeans compared with whites in inner city Manchester. Ann Rheum Dis. 1994;53(5):293–7.

Reason for exclusion: sub-population

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Reason for exclusion: sub-population

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Reason for exclusion: sub-population

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Reason for exclusion: out of scope

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Reason for exclusion: sub-population

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Reason for exclusion: systematic review

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Reason for exclusion: out of scope

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Reason for exclusion: out of scope

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Reason for exclusion: Using secondary data

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Reason for exclusion: out of scope

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Reason for exclusion: out of scope

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Reason for exclusion: sub-population

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Reason for exclusion: sub-population

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Reason for exclusion: secondary data analysis

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Reason for exclusion: out of scope

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Reason for exclusion: sub-population

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Reason for exclusion: sub-population

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Reason for exclusion: study design

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Reason for exclusion: review

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Reason for exclusion: sub-population

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Reason for exclusion: out of scope

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Reason for exclusion: sub-population

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Reason for exclusion: Study design

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Reason for exclusion: sub-population

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Reason for exclusion: sub-population

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Reason for exclusion: review

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Reason for exclusion: out of scope

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Reason for exclusion: RA incidence

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Reason for exclusion: review

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Reason for exclusion: out of scope

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Reason for exclusion: Using secondary data

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Reason for exclusion: out of scope

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Reason for exclusion: out of scope

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Reason for exclusion: sub-population

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Reason for exclusion: out of scope

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Reason for exclusion: duplicate

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Reason for exclusion: review

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Reason for exclusion: review

Zeng QY, Chen R, Darmawan J, Xiao ZY, Chen SB, Wigley R, et al. Rheumatic diseases in China. Arthritis research & therapy. 2008;10(1):R17.

Reason for exclusion: review

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Reason for exclusion: Article in Chinese

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Reason for exclusion: Using secondary data

van Baal PH, Engelfriet PM, Hoogenveen RT, Poos MJ, van den Dungen C, Boshuizen HC. Estimating and comparing incidence and prevalence of chronic diseases by combining GP registry data: the role of uncertainty. BMC Public Health. 2011;11:163.

Reason for exclusion: Study design

Supplementary Table 4. A chronological overview of the 60 published population-based studies that were included in the systematic review.

Reference	Year	Country	Prevalence percentage (95% CI)	Size of the sample (n) or population (N)	Methodology	Data source	Classification Criteria used	Geographic population setting
1. Moolenburgh et al. (1)	1986	Lesotho	1.8 (1.09, 2.78)	n= 1070	PointP	P.B.SU	ARA criteria 1956	Rural
2. Aho et al. (2)	1989	Finland	1.9 (1.59, 2.24)	n= 7124	PeriodP	P.B.SU	Clinical diagnosis	Mixed
3. Pountain. (3)	1991	Oman	0.36 (0.14, 0.74)	n=1925	PointP	P.B.SU	Revised ARA 1987	Mixed
4. Darmawan et al. (4)	1993	Indonesia	0.3 (0.06, 0.84)	n=1071	PointP	P.B.SU	ARA criteria 1956	Urban
			0.2 (0.09, 0.37)	n=4683	PointP	P.B.SU	ARA criteria 1956	Rural
5. Malaviya et al. (5)	1993	India	0.75 (0.48, 0.10)	n=3393	PointP	P.B.SU	Revised ARA 1987	Rural
6. Silman et al. (6)	1993	Nigeria	0.0 (0.00, 0.18)	n=2000	PointP	P.B.SU	Revised ARA 1987	Rural
7. Hakala et al. (7)	1993	Finland	0.8 (0.67, 0.94)	N=18300	PointP	AdminD	Revised ARA 1987	Mixed
8. Hameed et al. (8)	1995	Pakistan	0.42 (0.24, 0.66)	n=4232	PointP	P.B.SU	Clinical diagnosis	Urban
9. Drosos et al. (9)	1997	Greece	0.34 (0.30, 0.37)	N=128916	PeriodP	AdminD	Revised ARA 1987	Urban
10. Dans et al. (10)	1997	Philippines	0.17 (0.05, 0.39)	n=3006	PeriodP	P.B.SU	Revised ARA 1987	Urban
11. Kvien et al. (11)	1997	Norway	0.38 (0.12, 0.87)	n=1333	PeriodP	RegistryD	Clinical diagnosis	Urban
			0.6 (0.41, 0.82)	n=5886	PointP	P.B.SU	Clinical diagnosis	Urban
12. Stojanovic et al. (12)	1998	Yugoslavia	0.18 (0.04, 0.46)	n=2184	PeriodP	P.B.SU	Revised ARA 1987	Urban
13. Chaiamnuay et al. (13)	1998	Thailand	0.12 (0.02, 0.35)	n=2463	PointP	P.B.SU	Revised ARA 1987	Rural
14. Cimmino et al. (14)	1998	Italy	0.33 (0.16, 0.59)	n=3294	PeriodP	P.B.SU	Modified ARA 1987	Rural

15. Al-Dalaan et al. (15)	1998	Saudi Arabia	0.22 (0.11, 0.37)	n=5891	PointP	P.B.SU	Revised ARA 1987	Mixed
16. Simonsson et al. (16)	1999	Sweden	0.51 (0.31, 0.78)	n=3928	PointP	P.B.SU	Modified ARA 1987	Urban
17. Gabriel et al. (17)	1999	USA	1.07 (0.65, 1.64)	n=1878	PeriodP	AdminD	Revised ARA 1987	Urban
18. Shichikawa et al. (18)	1999	Japan	0.29 (0.13, 0.55)	n=3000	PeriodP	P.B.SU	Rome ARA 1961	Rural
19. Power et al. (19)	1999	Ireland	0.5 (0.18, 1.07)	n=1227	PointP	P.B.SU	Revised ARA 1987	Mixed
20. Llerena et al. (20)	2000	Cuba	2.7 (1.18, 5.23)	n=300	PointP	P.B.SU	Revised ARA 1987	Urban
21. Riise et al. (21)	2000	Norway	0.43 (0.39, 0.47)	N=107787	PeriodP	AdminD	Revised ARA 1987	Mixed
22. Spindler et al. (22)	2002	Argentina	0.2 (0.18, 0.21)	N=352089	PeriodP	AdminD	Revised ARA 1987	Urban
23. Carmona et al. (23)	2002	Spain	0.5 (0.28, 0.82)	n=2998	PointP	P.B.SU	Modified ARA 1987	Mixed
24. Symmons et al. (24)	2002	UK	0.81 (0.61, 1.04)	n=7050	PointP	P.B.SU	Revised ARA 1987	Mixed
25. Hoa et al. (25)	2003	Vietnam	0.28 (0.10, 0.61)	n=2119	PointP	P.B.SU	Revised ARA 1987	Urban
26. Dai et al. (26)	2003	China	0.47 (0.31, 0.66)	n=6584	PeriodP	P.B.SU	Revised ARA 1987	Urban
27. Senna et al. (27)	2004	Brazil	0.46 (0.25, 0.77)	n=3038	PointP	P.B.SU	Revised ARA 1987	Urban
28. Akar et al. (28)	2004	Turkey	0.49 (0.26, 0.82)	n=2835	PeriodP	P.B.SU	Modified ARA 1987	Urban
29. Kacar et al. (29)	2005	Turkey	0.38 (0.19, 0.66)	n=3173	PeriodP	P.B.SU	Revised ARA 1987	Urban
30. Haq et al. (30)	2005	Bangladesh	0.4 (0.13, 0.92)	n=1279	PointP	P.B.SU	Revised ARA 1987	Urban
			0.2 (0.03, 0.64)	n=1230	PointP	P.B.SU	Revised ARA 1987	Urban
			0.7 (0.41, 1.10)	n=2568	PointP	P.B.SU	Revised ARA 1987	Rural
31. Edwards et al. (31)	2005	UK	0.5 (0.49, 0.50)	N=3500000	PeriodP	AdminD	Clinical diagnosis	Mixed
32. Salaffi et al. (32)	2005	Italy	0.46 (0.22, 0.84)	n=2155	PointP	P.B.SU	Revised ARA 1987	Mixed

33. Guillemin et al. (33)	2005	France	0.34 (0.23, 0.48)	n=9395	PointP	P.B.SU	Clinical diagnosis	Mixed
34. Kiss et al. (34)	2005	Hungary	0.37 (0.26, 0.51)	n=10000	PointP	P.B.SU	Revised ARA 1987	Mixed
35. Lacaille et al. (35)	2005	Canada	0.76 (0.75, 0.76)	N=3646053	PeriodP	AdminD	Clinical diagnosis	Mixed
36. Hanova et al. (36)	2006	Czech Republic	0.61 (0.57, 0.64)	N=186077	PeriodP	RegistryD	Revised ARA 1987	Mixed
37. Andrianakos et al. (37)	2006	Greece	0.68 (0.51, 0.87)	n=8740	PeriodP	P.B.SU	Revised ARA 1987	Mixed
38. Adomaviciute et al. (38)	2008	Lithuania	0.92 (0.70, 1.18)	n=6524	PointP	P.B.SU	Revised ARA 1987	Urban
39. Davatchi et al. (39)	2009	Iran	0.19 (0.03, 0.55)	n=1565	PointP	P.B.SU	Clinical diagnosis	Rural
40. Anagnostopoulos et al. (40)	2010	Greece	0.57 (0.34, 0.87)	n=3528	PeriodP	P.B.SU	Revised ARA 1987	Mixed
41. Della Rossa et al. (41)	2010	Italy	0.51 (0.42, 0.60)	n=26709	PeriodP	RegistryD	Modified ARA 1987	Mixed
42. Neovius et al. (42)	2011	Sweden	0.7 (0.65, 0.74)	N=123363	PeriodP	LinkedD	Clinical diagnosis	Mixed
43. Pedersen et al. (43)	2011	Denmark	0.26 (0.13, 0.44)	n=4995	PointP	P.B.SU	Modified ARA 1987	Mixed
44. Rodriguez-Amado et al. (44)	2011	Mexico	0.4 (0.24, 0.62)	n=4713	PeriodP	P.B.SU	Revised ARA 1987	Mixed
45. Malemba et al. (45)	2012	Congo	0.6 (0.40, 0.85)	n=5000	PointP	P.B.SU	Revised ARA 1987	Urban
46. Cakir et al. (46)	2012	Turkey	0.32 (0.24, 0.41)	n=17835	PointP	P.B.SU	Modified ARA 1987	Rural
47. Chaaya et al. (47)	2012	Lebanon	1 (0.69, 1.38)	n=3530	PeriodP	P.B.SU	Revised ARA 1987	Mixed
48. Widdifield et al. (48)	2013	Canada	0.9 (0.89, 0.90)	N=10851140	PeriodP	LinkedD	Clinical diagnosis	Urban
49. Chung et al. (49)	2013	Taiwan	0.12 (0.12, 0.12)	N=23740000	PeriodP	AdminD	Revised ARA 1987	Mixed
50. Kuo et al. (50)	2013	Taiwan	0.1 (0.09, 0.09)	N=16476882	PeriodP	AdminD	Revised ARA 1987	Mixed
51. Otsa et al. (51)	2013	Estonia	0.46 (0.44, 0.47)	N=1340127	PeriodP	AdminD	Revised ARA 1987	Mixed

52. Sung et al. (52)	2013	South Korea	0.27 (0.26, 0.27)	N=49404660	PeriodP	AdminD	Clinical diagnosis	Mixed
53. Yu et al. (53)	2013	Taiwan	0.05 (0.04, 0.05)	N=23753407	PeriodP	AdminD	Revised ARA 1987	Mixed
54. Rossini et al. (54)	2014	Italy	0.41 (0.40, 0.41)	N=4715283	PointP	LinkedD	Clinical diagnosis	Mixed
55. Moghimi et al. (55)	2015	Iran	0.51 (0.34, 0.72)	n=5830	PeriodP	P.B.SU	Clinical diagnosis	Urban
56. Guevara-Pacheco et al. (56)	2016	Mexico	0.9 (0.61, 1.27)	n=3400	PointP	P.B.SU	Revised ARA 1987	Urban
			0.8 (0.41, 1.39)	n=1477	PointP	P.B.SU	Revised ARA 1987	Rural
57. Jean et al. (57)	2017	Canada	0.8 (0.79, 0.80)	N=7369500	PeriodP	LinkedD	Clinical diagnosis	Urban
58. Hunter et al. (58)	2017	USA	0.46 (0.45, 0.46)	N=31316902	PeriodP	AdminD (A)	Clinical diagnosis	Mixed
			0.5 (0.49, 0.50)	N=35083356	PeriodP	AdminD (B)	Clinical diagnosis	Mixed
59. Batko et al. (59)	2017	Poland	0.9 (0.59, 1.30)	n=3000	PeriodP	P.B.SU	Clinical diagnosis	Mixed
60. Kumar et al. (60)	2018	India	0.47 (0.30, 0.70)	n=5053	PeriodP	P.B.SU	Clinical diagnosis	Urban
			0.15 (0.06, 0.29)	n=5118	PeriodP	P.B.SU	Clinical diagnosis	Rural

PointP= Point-Prevalence, PeriodP= Period-Prevalence, P.B.SU= Population-based survey, AdminD= Administrative Data, RegistryD= Registry Data, LinkedD= Linked Data, AdminD (A): Truven Health MaretScan Research Database, AdminD (B): IMF PharMetric Plus Database, ARA: American Rheumatism Association.

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Supplementary Table 5. Risk of bias assessment. A detailed of the risk bias assessment results for included published studies are reported in Supplemental Table 7.

Citations	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Summary risk bias assessment
1. Moolenburgh et al.	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Low
2. Aho et al.	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Low
3. Pountain	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Low
4. Darmawan et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Low
5. Malaviya	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Low
6. Silman et al.	Y	N	N	Y	N	N	N	Y	N	Y	Moderate
7. Hakala et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Low
8. Hameed et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Low
9. Drosos et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low
10. Dans et al.	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Low
11. Kvien et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low
12. Stojanovic et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low
13. Chaiamnuay et al.	Y	Y	N	Y	N	Y	Y	N	N	Y	Moderate
14. Cimmino et al.	Y	Y	Y	N	Y	Y	N	Y	Y	N	Low
15. Al-Dalaan et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Low
16. Simonsson et al.	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Low
17. Gabriel et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low
18. Shichikawa et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low
19. Power et al.	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Low
20. Llerena et al.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Low
21. Riise et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low
22. Spindler et al.	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Low

23. Carmona et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
24. Symmons et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
25. Hoa et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Low**
26. Dai et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Low**
27. Senna et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
28. Akar et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
29. Kacar et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
30. Haq et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Low**
31. Edwards et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
32. Salaffi et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
33. Guillemin et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
34. Kiss et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
35. Lacaille et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
36. Hanova et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
37. Andrianakos et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
38. Guevara-Pacheco et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Low**
39. Adomaviciute et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**U**	**Low**
40. Davatchi et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Low**
41. Anagnostopoulos et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
42. Della Rossa et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
43. Neovius et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
44. Pedersen et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
45. Rodriguez-Amado et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Low**
46. Malemba et al	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
47. Cakir et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
48. Chaaya et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Low**
49. Widdifield et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
50. Chung et al.	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**N**	**Y**	**N**	**N**	**Moderate**

51. Kuo et al.	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**N**	**Y**	**N**	**N**	**Moderate**
52. Otsa et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
53. Sung et al.	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**N**	**Y**	**N**	**N**	**Moderate**
54. Yu et al.	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**N**	**Y**	**N**	**N**	**Moderate**
55. Rossini et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Low**
56. Moghimi et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Low**
57. Jean et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
58. Hunter et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Y**	**N**	**N**	**Moderate**
59. Batko et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**Low**
60. Kumar et al.	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Low**

Q= Question, Y= Yes (0 point), N=No (1 point), Low risk=0 to 3 points, Moderate risk= 4 to 6 points, High risk= 7 to 10 points.

The risk bias assessment of the included published studies was low in 53 studies (88.3%), moderate in seven studies (11.7%), and there was no high-risk of bias across studies. In five out of seven studies with a moderate risk of bias, the numerators and dominators data used to calculate prevalence proportion were estimated close to zero based on administrative data, raising questions about the validity of data coding in the absence of validity testing. However, absence and low RA prevalence were reported in two P.B.SU studies published in Nigeria and Thailand may conceive the low RA prevalence in a different part of the world. Therefore, all these seven studies with a moderate risk of bias were included in our review as they may represent the real clinical picture and the nature of the RA disease.

Supplementary Table 6. The population sampling methodology and the number of participants for examined cohort studies.

Number of participants	Number of sub-studies based on the sampling population studies	Number of sub-studies based on population database studies
300 <= 4,999	34	0
5,000- 9,999	12	0
10,000 – 99,999	3	1
100,000- 999,999	0	5
=>1000,000	0	12
Total: 67 cohort studies	49	18

Supplementary Table 7. Overall mean of the point and period prevalence rate of RA based on the population sampling methodology in the study.

The population sampling methodology	Prevalence method used	N	Mean of RA prevalence rates	Minimum	Maximum	Std. Deviation
The sampling population studies						
	Point prevalence	30	0.56	0	2.7	0.52
	Period prevalence	19	0.57	0.15	1.9	0.41
Total		**49**	0.56	0	2.7	0.48
The population database studies						
	Point prevalence	2	0.6	0.41	0.8	0.27
	Period prevalence	16	0.44	0.05	0.9	0.26
Total		**18**	**0.46**	**0.05**	**0.9**	**0.25**
Total cohort studies		**67**				

Supplementary Table 8. Overall mean of the point prevalence rate of RA in the study.

Continent	Country	N	Mean of the point prevalence rate (%)	SD
Europe	Italy	2	0.43	0.03
	Lithuania	1	0.92	.
	UK	1	0.81	.
	Finland	1	0.8	.
	Norway	1	0.59	.
	Sweden	1	0.51	.
	Ireland	1	0.5	.
	Spain	1	0.5	.
	Hungary	1	0.37	.
	France	1	0.34	.
	Denmark	1	0.26	.
	Total	**12**	**0.53**	**0.20**
Asia	Bangladesh	3	0.43	0.25
	Indonesia	2	0.25	0.07
	India	1	0.75	.
	Pakistan	1	0.42	.
	Oman	1	0.36	.
	Turkey	1	0.32	.
	Vietnam	1	0.28	.
	Saudi Arabia	1	0.22	.
	Iran	1	0.19	.
	Thailand	1	0.12	.
	Total	**13**	**0.34**	**0.19**
Africa	Lesotho	1	1.8	.
	Congo	1	0.6	.

Continent	Country	N	Mean of the point prevalence rate (%)	SD
	Nigeria	1	0	.
	Total	**3**	**0.80**	**0.91**
North America	Mexico	2	0.85	0.07
	Cuba	1	2.70	.
	Total	**3**	**1.46**	**1.06**
South America	Brazil	1	0.46	.
	Total	**1**	**0.46**	**.**
Oceania	Australia	0	-	-
Total		**32**	**0.56**	**0.51**

Supplementary Table 9. Overall mean of the period prevalence rates of RA in the study.

Continent	Country	N	Mean of the period prevalence rate (%)	SD
Europe	Greece	3	0.53	0.17
	Italy	2	0.42	0.12
	Norway	2	0.40	0.03
	Finland	1	1.9	.
	Poland	1	0.9	.
	Sweden	1	0.7	.
	Czech Republic	1	0.61	.
	UK	1	0.5	.
	Estonia	1	0.46	.
	Yugoslavia	1	0.18	.
	Total	**14**	**0.60**	**0.41**
Asia	Taiwan	3	0.09	0.03
	Turkey	2	0.43	0.07
	India	2	0.31	0.22
	Lebanon	1	1	.
	Iran	1	0.51	.
	China	1	0.47	.
	Japan	1	0.29	.
	South Korea	1	0.27	.
	Philippines	1	0.17	.
	Total	**13**	**0.34**	**0.25**
North America	Canada	3	0.82	0.07
	USA	3	0.67	0.34
	Mexico	1	0.40	.
	Total	**7**	**0.69**	**0.25**

Continent	Country	N	Mean of the period prevalence rate (%)	SD
South America	Argentina	1	0.19	.
	Total	**1**	**0.19**	**.**
Africa	-	0	.	.
Oceania	Australia	0	.	.
Total		**35**	**0.51**	**0.35**

***Supplementary Table 10**. Overall mean of the continental point prevalence rates of RA using a different type of data sources.*

Continent	Source	N	Mean of point prevalence rates (%)	Minimum (%)	Maximum (%)	SD
North America	Population based survey	3	1.46	0.8	2.7	1.06
	Total	**3**	**1.46**	**0.8**	**2.7**	**1.06**
Europe	Admin Data	1	0.8	0.8	0.8	.
	Population based survey	10	0.52	0.26	0.92	0.2
	Linked Data	1	0.41	0.41	0.41	.
	Total	**12**	**0.53**	**0.26**	**0.92**	**0.2**
Africa	Population based survey	3	0.8	0	1.8	0.91
	Total	**3**	**0.8**	**0**	**1.8**	**0.91**
South America	Population based survey	1	0.46	0.46	0.46	.
	Total	**1**	**0.46**	**0.46**	**0.46**	**.**
Asia	Population based survey	13	0.34	0.12	0.75	0.19
	Total	**13**	**0.34**	**0.12**	**0.75**	**0.19**
Oceania	-	-	-	-	-	-
Total of cohort studies		**32**	**0.56**	**0**	**2.7**	**0.51**

***Supplementary Table 11**. Overall mean of the continental period prevalence rates of RA using a different type of data sources.*

Continent	Source	N	Mean of period prevalence rates (%)	Minimum (%)	Maximum (%)	SD
North America	Linked Data	2	0.85	0.8	0.9	0.07
	Admin Data	4	0.69	0.46	1.07	0.28
	Population based survey	1	0.4	0.4	0.4	.
	Total	**7**	**0.69**	**0.4**	**1.07**	**0.25**
Europe	Population based survey	6	0.76	0.18	1.9	0.61
	Linked Data	1	0.70	0.70	0.70	.
	Registry	3	0.49	0.38	0.61	0.12
	Admin Data	4	0.43	0.34	0.5	0.07
	Total	**14**	**0.69**	**0.18**	**1.9**	**0.41**
Asia	Population based survey	9	0.43	0.15	1	0.25
	Admin Data	4	0.13	0.05	0.27	0.09
	Total	**13**	**0.34**	**0.05**	**1**	**0.26**
South America	Admin Data	1	0.19	0.2	0.2	.
	Total	**1**	**0.19**	**0.2**	**0.2**	**.**
Africa	-	-	-	-	-	-
Oceania	-	-	-	-	-	-
Total of cohort studies		**35**	**0.51**	**0.05**	**1.90**	**0.35**